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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,691	09/30/2004	Chad Rue	FIS920040175US1	5690

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CANTOR COLBURN LLP - IBM FISHKILL  
55 GRIFFIN ROAD SOUTH  
BLOOMFIELD, CT 06002

EXAMINER
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YANTORNO, JENNIFER M

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 08/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/711,691	Applicant(s) RUE ET AL.	
	Examiner Jennifer Yantorno	Art Unit 2881	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 6/13/2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Arguments***

Applicant's arguments, filed 6/13/2006, with respect to claims 1-19 have been fully considered and are persuasive. The rejection of claims 1-19 has been withdrawn. A new non-final Office Action is issued below.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 11, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Motoi et al. (US 2004/0262516).

Regarding claim 1, '2516 teaches an apparatus for manipulating the temperature of a sample used in focused ion beam processing comprising a base member (Fig. 2, #8), a thermoelectric module disposed over the base member (#10), and a sample (#1) mounted on a mounting surface of the thermoelectric module wherein the thermoelectric module is configured so as to reduce the temperature of said sample with respect to an ambient FIB tool temperature (Paragraph 0065).

Regarding claims 2 and 12, '2516 teaches the thermoelectric module comprises a Peltier device (Paragraph 0067).

Regarding claim 11, '2516 teaches a method for implementing FIB processing comprising mounting a sample on a thermoelectric element included within an FIB tool (Paragraphs 0084 and 0063, Fig. 2), controlling said thermoelectric element so as to reduce the temperature of the sample with respect to an ambient FIB tool temperature (Paragraph 0065), and applying an FIB to the sample (Paragraph 0088).

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoi et al. (US 2004/0262516) in view of Richardson (US 6,751,516).

Regarding claims 13 and 18, '516 (Richardson) teaches utilizing the FIB to deposit a layer on the sample and utilizing the FIB in a removal process to remove material from the sample (Col. 13, ll. 16-21). It would have been obvious to use the FIB to deposit or remove material from the sample because this is a notoriously known use of an FIB.

Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoi et al. (US 2004/0262516), in view of Richardson (US 6,751,516), further in view of Suzuki (US 4,555,626).

Regarding claim 3, the above-mentioned prior art meets all claim limitations with the exception of the thermoelectric module is configured to draw heat from the sample and exhaust the heat through the base member. '626 teaches that the thermoelectric module is configured to draw heat from the sample and exhaust the heat through the

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base member (Col. 3, ll. 50-55 and Fig. 1). It would have been obvious to one skilled in the art at the time of the invention to draw and exhaust the heat this way because the base member is cooled by convection or conduction.

Regarding claim 4, '626 teaches that the thermoelectric module is electrically coupled to a current source through an electrical connector disposed through a vacuum chamber wall and into an interior vacuum section (Fig. 1). '2516 teaches an FIB tool. It would have been obvious to arrange the electrical connector through the vacuum chamber wall and into an interior vacuum chamber because the thermoelectric module needs power, and the FIB needs a vacuum environment to operate, and there would be no other way to connect to power to the thermoelectric module while maintaining the vacuum environment.

Regarding claim 5, '626 teaches a thermal ballast module mounted on the base member (Fig. 1, #10).

Regarding claims 6 and 7, '626 teaches the claimed invention except for the thermal ballast being adjacent to, or mounted beneath, the thermoelectric module. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to make the thermal ballast adjacent to or mounted beneath the thermoelectric module since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoi et al. (US 2004/0262516), in view of Richardson (US 6,751,516), further in view of Suzuki (US 4,555,626), further in view of Harrison et al. (US 2002/0162339).

Regarding claim 8, the aforementioned prior art meets all claim limitations with the exception of the construction of the thermal ballast. '339 teaches a thermal ballast comprising a sealed hollow vessel and a plurality of internal fins configured for facilitating heat transfer from the base member to an internal ballast material (Paragraphs 0043, 0044, 0053 and 0054, and Fig. 2, #14 and #11). Although '339 does not explicitly disclose that the ballast vessel and fins are made of high thermal conductive and high heat capacity material, it would be obvious to one of ordinary skill in the art to fabricate these elements out of heat conductive and capacitive materials to make a more efficient thermal ballast that rapidly removes heat from the sample.

Regarding claim 9, '339 teaches a plurality of cooling ports within the base member for receiving a cooling medium circulated therethrough supplied by a cooling supply line (Paragraph 0065, 0066 and Fig. 3).

Regarding claim 10, '339 teaches that the cooling supply line is coupled to a cooling medium connector disposed through insulation (Paragraph 0053).

Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoi et al. (US 2004/0262516), in view of Richardson (US 6,751,516), further in view of Suzuki (US 4,555,626), further in view of Ring et al. (US 6,372,627).

Regarding claims 14-16, the aforementioned prior art meet all claim limitations with the exception of the SiO<sub>2</sub> insulating layer being deposited using a silicon-bearing precursor such as TMCTS with O<sub>2</sub>. '627 teaches all of this (Col. 7, ll. 58-Col. 8, ll. 23). It would have been obvious to one skilled in the art at the time of the invention to deposition a silicon dioxide layer in this manner as it is well-known in the art.

Claims 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoi et al. (US 2004/0262516), in view of Richardson (US 6,751,516), further in view of Suzuki (US 4,555,626), further in view of Huynh et al. (US 6,863,787).

Regarding claim 17, the aforementioned prior art meets all claim limitations with the exception of the metal layer deposited uses tungsten hexacarbonyl. '787 teaches that the metal layer deposited uses tungsten hexacarbonyl (Col. 7, ll. 26-28). It would have been obvious to one skilled in the art at the time of the invention to deposit a metal layer using tungsten hexacarbonyl as tungsten hexacarbonyl is a known precursor in the art.

Regarding claim 19, '787 teaches the removal process comprising milling copper using an  $\text{XeF}_2$  precursor (Table 1).

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Yantorno whose telephone number is (571) 272-5918. The examiner can normally be reached on Monday-Friday, 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JY

  
JACK BERMAN  
PRIMARY EXAMINER